

5 **WHAT IS CLAIMED IS:**

1. An apparatus for self-contained treatment of an aqueous system comprising:

a housing enclosing a controller, a feed pump and a treatment agent contained within one or more containers;

a sensor electrically communicating with the controller for measuring a parameter

10 of water within the aqueous system;

a bleed pump electrically communicating with the controller such that the controller controllably activates the bleed pump when the parameter is at or exceeds a predetermined level wherein the bleed pump removes water from the aqueous system upon activation; and

the feed pump electrically communicating with the controller such that the controller controllably activates the feed pump during activation of the bleed pump wherein the feed pump acts to deliver the treatment agent to the water cooling system.

2. The apparatus of claim 1 wherein the treatment agent includes a scale inhibitor agent, a corrosion inhibitor agent, an anti-biofouling agent or combinations thereof.

20 3. The apparatus of claim 1 wherein the controller electrically communicates with the feed pump, the bleed pump or both via a timing device located within the housing.

4. The apparatus of claim 1 wherein the apparatus further comprises a 12 volt power source for supplying power to the apparatus.

25 5. The apparatus of claim 1 wherein the feed pump is connected to at least two containers that are hydraulically connected to deliver the treatment agent to the feed pump.

5           6.     The apparatus of claim 5 wherein the apparatus includes a first container  
connected to the feed pump and a second container hydraulically connected to the first container  
such that the second container feeds the treatment agent into the first container as the treatment  
agent is delivered to the feed pump.

10           7.     The apparatus of claim 1 wherein the bleed pump is a submersible pump that is  
located within the aqueous system.

8.     The apparatus of claim 1 wherein the sensor is selected from the group consisting  
of pH, ion selective electrode, oxidation/reduction potential, conductivity, oxygen, temperature,  
capacitance, piezoelectric transducer or combinations thereof.

15           9.     An apparatus for monitoring and controlling treatment of a water cooling system  
comprising:

          a self-contained treatment unit including a control device, an inhibitor feed pump  
and an inhibitor agent contained within one or more containers wherein the self-contained  
treatment unit is powered by a 12 volt power source;

          a conductivity sensor electrically communicating with the control device such that  
20   the conductivity sensor transmits a signal to the control device indicative of electrical  
conductivity of water from the water cooling system;

          a submersible bleed pump electrically communicating with the control device  
such that the control device controllably activates the submersible bleed pump when the signal is  
at or exceeds a preset value wherein the submersible bleed pump removes water from the water  
25   cooling system upon activation thereof; and

5 the inhibitor feed pump electrically communicating with the control device such that the control device controllably activates the inhibitor feed pump wherein the inhibitor feed pump acts to deliver the inhibitor agent to the water cooling system for treating scale and/or corrosion.

10 10. The apparatus of claim 9 wherein the submersible bleed pump and inhibitor feed pump each electrically communicate with the control device via a timing device located within the housing.

11. The apparatus of claim 9 wherein the treatment unit further comprises a drip detector for monitoring flow of the inhibitor agent to the inhibitor feed pump.

15 12. The apparatus of claim 9 wherein the treatment unit further comprises a feed pump adapted to controllably deliver an anti-biofouling agent from one or more containers to the water cooling system.

20 13. The apparatus of claim 9 wherein the treatment unit further comprises a first container connected to the inhibitor feed pump and a second container hydraulically connected to the first container such that the inhibitor agent is fed into the first container from the second container as the inhibitor agent flows to the inhibitor feed pump.

14. A system for monitoring and controlling treatment of an aqueous system comprising:

a sensor located within the aqueous system for measuring a parameter of water within the aqueous system which is capable of varying with respect to changes in the aqueous system due to scale, corrosion and/or biofouling;

a submersible bleed pump for removing water from the aqueous system; and

5 a self-contained treatment unit electrically communicating with the sensor and the bleed pump such that the self-contained treatment unit controllably activates the submersible bleed pump to remove water from the aqueous system when the parameter of water is at or exceeds a predetermined level, the treatment unit comprising a housing for enclosing a controller, an inhibitor feed pump, an inhibitor agent contained within one or more containers  
10 wherein the controller controllably activates the inhibitor feed pump to deliver the inhibitor agent to the aqueous system during activation of the bleed pump.

15. The system of claim 14 further comprising one or more timing devices each communicating with the controller to controllably activate the submersible bleed pump, the inhibitor feed pump or both wherein the timing devices are located within the housing.

16. The system of claim 14 wherein the self-contained treatment unit further comprises a feed pump for controllably delivering an anti-biofouling agent from one or more hydraulically connected containers to the aqueous system.

17. The system of claim 16 wherein the self-contained treatment unit further comprises a detector for monitoring flow of the inhibitor agent, the anti-biofouling agent or  
20 both.

18. A method of monitoring and controlling treatment of an aqueous system comprising the steps of:

providing a self-contained treatment unit comprising a housing for enclosing an inhibitor pump, an inhibitor agent contained within one or more containers and a controller;

25 measuring a parameter of water within the aqueous system sensitive to changes in the aqueous system due to scale, corrosion and/or biofouling;

5           producing a signal indicative of the measured parameter;  
transmitting the signal to the controller for controllably activating a submersible  
bleed pump to remove water from the aqueous system when the signal is at or exceeds a preset  
value; and  
controllably activating the inhibitor feed pump such that the inhibitor agent is  
10 delivered to the aqueous system during activation of the bleed pump to treat scale and/or  
corrosion.

19.    The method of claim 18 further comprising controllably activating a feed pump to  
deliver an anti-biofouling agent contained within one or more containers to the aqueous system  
wherein the feed pump, anti-biofouling agent and containers are located within the housing of the  
15 treatment unit.

20.    The method of claim 18 wherein the treatment unit is powered by a 12 volt power  
source.